

MODULAR ELECTRIC MOTORIZING UNIT FOR WELDING PLIERS

5           The present invention relates to an electric motorizing unit for welding pliers, with an electric welding pliers motor, of the type comprising a core provided with a fixing flange and bearing the stator, said core being closed at its ends by a front plate and a rear plate, a rotor turning in  
10 the stator and provided with a motor shaft, the rear plate being arranged to carry the supply connection of the motor and if desired control means for the motor such as resolvers, encoders and/or decoders, the front plate supporting the motor shaft.

15           Such electric motor units are used for to control the opening/closing of welding pliers and preferably replace the pneumatic or hydraulic controls previously used.

          A major drawback of the electric motor units known until now for such a use resides in the fact that there  
20 must, for a same motor power, be in practice designed specially for each use, in particular for taking account of the type of cooling required by the utilization envisaged, of the specific connection and controls for this use, by the type of mechanical transmission chosen, etc.

25           As a result, there is considerable complication of the production and storage, which gives rise to high cost and large delay of fabrication.

          The present invention seeks to overcome these drawbacks of the known electric motor units, by permitting an  
30 important reduction of cost and of the delay of production, thanks to a modular design of the unit.

          To this end, the electric motor unit according to the invention is characterized by the fact that the core is

arranged to receive optionally a removable cooling module. With the unit according to the invention, the optional cooling equipment can be emplaced by the producer of the welding pliers, before mounting of the motor on the assembled pliers.

Without an added cooling module, the electric motor is cooled only by natural convection.

The cooling modules can preferably comprise a ribbed or finned cover for natural convection, a hollow cover for the passage of forced air by a fan, or a cover for the circulation of a cooling liquid.

The modular design of the electric motor unit according to the invention permits, from a standard core, adapting the supply and control or mechanical transmission components to the intended use.

To this end, according to a preferred embodiment of the invention, the rear pre-equipped plate is arranged to be fixed removably on the core.

Similarly, the invention provides that the front plate is arranged to be fixed interchangeably on the front fixing flange of the core; the motor is interchangeable to be adapted to the type of transmission dictated by the front plate.

According to further features of the invention, the electric motor unit comprises a braking module arranged to be mounted optionally between the rear plate and the core.

The unit according to the invention can as a result be provided as selected with a standard motor core provided with a stator with modules selected as a function of the intended use and permitting obtaining optimum capability as a function of the intended use.

The producer of welding pliers thus has a stock of standard motor cores and modular components and can thus

assemble the electric motorizing units adapted to the intended uses, before mounting them on the welding pliers which will have been assembled. The cost and delays are substantially reduced relative to the specific motorizing unit ordered from the motor producer.

The invention will be understood from a reading of the following description with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of a modular electrical motorizing unit according to one embodiment of the invention, and

Figures 2 to 5 show schematically various configurations of cooling the unit of Figure 1.

The modular electrical motorizing unit according to the invention, shown schematically in Figure 1, comprises a core 1 provided with a front fixing flange 2 and containing the stator (not shown) of the electrical motor. A motor 3 is provided with a motor shaft 4 which is carried by a front plate 5, a rear plate 5 closing the core 1 opposite the fixing flange 2.

The unit can moreover comprise a cooling system 7 surrounding the core 1 and a braking module 8.

Up to now, such a unit is designed as a function of a precise application and assembled by the motor producer or any other producer. As a result, the cost is high, because of the short production series, and a long delay of production.

The present invention provides, on a standard subunit, comprising a core 1 with its fixing flange and its stator, the unit of other components selected from a store of modules as a function of the particular use intended.

The rotor 3 can for example carry a channel shaft 4, for direct correction of the return pinions, or a hollow

shaft 4 provided with a nut with satellite rollers or balls ensuring linear movement of an endless screw (not shown). The front flange 5 selected thus will have a plate with a simple bearing for the channel shaft or a plate with a combined bearing permitting the integration of the endless screw and the resistance of axial forces.

The rear plate 6, which will be mounted, will comprise the connection specific to the intended use. It could comprise means for controlling the electrical motor, such as encoders and/or decoders, pre-mounted or pre-wired.

A braking module 8, for example upon current failure, could be interposed between the core 1 and the rear flange 6.

According to an important characteristic of the invention, the unit could be equipped with a cooling module 7 surrounding the core 1.

In the absence of a cooling module (Figure 2), the motor is cooled only by natural convection.

The cooling model can be constituted by a cover 9 which is ribbed or provided with fins (Figure 3) assuring enhanced natural convection.

For applications requiring greater cooling, the cooling module is constituted by a hollow cover 10 (Figure 4) provided with a rear fan 11 and a front discharge 12.

As needed, the cooling module could be constituted by a cover 13 for the circulation of a cooling liquid (Figure 5), said cover being hollow and/or provided with a coil.